

REMARKS

In response to the final Office Action dated 12 January 2006, the applicant requests reconsideration of the above-identified application in view of the following remarks. Claims 14-34 and 37-45 are pending in the application. Claims 14-34, 44, and 45 are allowed. Claims 37, 38, and 41 were rejected, and claims 39-40 and 42-43 were objected to. None of the claims are amended herein.

Allowable Subject Matter

The final Office Action indicated that claims 14-34 and 44-45 are allowed. The final Office Action also indicated that claims 39-40 and 42-43 would be allowable if rewritten in independent form. The applicant reserves the right to rewrite claims 39-40 and 42-43 in independent form, but believes that the base claim from which they depend is allowable in view of the remarks presented below.

Information Disclosure Statement

The applicant filed an Information Disclosure Statement on 17 October 2005. The applicant respectfully requests entry of that Information Disclosure Statement and requests that the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, the applicant requests that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the applicant with the next official communication.

Rejections of Claims Under §103

Claims 37 and 41 were rejected under 35 USC § 103(a) as being unpatentable over Master (U.S. 6,229,207 B1) in view of Bronson et al. (U.S. 5,288,944, Bronson). The applicant respectfully traverses.

Master issued on May 8, 2001, which less than one year before the 27 September 2001 filing date of the parent of the present application. The applicant does not admit that Master is prior art, and reserves the right to swear behind Master at a later date.

The MPEP requires a suggestion and a reasonable expectation of success for a rejection under 35 USC § 103.¹ The suggestion or motivation to combine references and the reasonable expectation of success must both be found in the prior art.²

Master relates to a pin grid array flip chip package.³ Master shows in Figure 2 a pin lead 30 joined to a conductive pad 28 by a solder fillet 36. The conductive pad 28 extends from a substrate 22.⁴ Master shows in Figure 3 a device assembly including a substrate 42 from which conductive pads 52 extend. Master shows pins 54 electrically and mechanically joined to the conductive pads 52 by solder fillets 56.⁵ Each pin of Master is soldered to a conductive pad that is fixed on a substrate.

Bronson relates to a pinned ceramic chip carrier.⁶ Bronson shows in Figure 2 and describes⁷ a pinned ceramic chip carrier 110 with pins 170 attached to contact pads 140 with solder 190. Heads 180 of the pins 170, the solder 190, and the contact pads 140 are encapsulated in a region of material 200. The material 200 is shown in Figure 2 as blanketing all of the heads 180, and rises above the heads 180 to cover a portion of the pins 170.

The final Office Action has not shown a suggestion to one skilled in the art to combine Master and Bronson, and has not shown a reasonable expectation of success. The showings of Bronson and Master teach away from their combination as put forward in the final Office Action.

The final Office Action states that an advantage of combining Master with Bronson is to “prevent the failure of the solder connections 190 during subsequent high temperature processes.”⁸ The final Office Action does not detail what high temperatures are contemplated. Master shows substrates that are organic and explains that “the soldering temperature cannot be higher than the decomposition temperature of the substrate.”⁹ Master goes on to describe its solder fillets that reflow below the decomposition temperature.¹⁰ The final Office Action has not shown evidence that the organic substrates of Master would be subject to the high temperatures

¹ MPEP 2143 quoted in the Response filed on 21 March 2005.

² MPEP 2143.

³ Master, Title.

⁴ Master, column 5, lines 19-26.

⁵ Master, column 5, lines 45-63.

⁶ Bronson, Title.

⁷ Bronson, column 8, lines 11-45.

⁸ Final Office Action, page 4.

⁹ Master, column 2, lines 38-50.

¹⁰ Master, column 4, lines 45-50; column 5, lines 40-45.

contemplated in Bronson. Therefore, the rationale put forward in the final Office Action for the combination of Master and Bronson does not appear to be applicable to Master which, in fact, prefers temperatures below the decomposition temperature. One skilled in the art would not have combined Master and Bronson on the basis of this rationale without further evidence. Furthermore, Master describes its solder joint as “mechanically strong”¹¹ without the addition of the material from Bronson.

The final Office Action also has not shown a reasonable expectation of success of this combination of Master and Bronson. Master indicates no need for additional protection of the solder fillets 36, 56. Master, in fact, teaches away from this modification proposed in the final Office Action. Master teaches that its solder fillet 36 forms “a mechanically strong joint between the pin lead and the conductive pad with little or no solder on the shaft.”¹² In fact, Master wants to avoid getting solder on the pin shaft because it interferes “with fitting the carrier member into a socket” and can “contaminate testing apparatus.”¹³ The final Office Action has not shown how adding the material 200 of Bronson to the pin joint of Master would avoid getting the material 200 on the pin shaft of Master. In fact, the material 200 is shown in Figure 2 of Bronson rises above the heads 180 to cover a portion of the pins 170. Such added material 200 on the pin shaft of Master could lead to the problems of fitting and contamination that Master is trying to avoid. The showings of Bronson and Master therefore teach away from their combination as put forward in the final Office Action.

In addition, the material 200 of Bronson is an epoxy resin¹⁴ that must be cured. The final Office Action has not addressed the issue of whether or not the organic substrate of Master would be damaged by the curing epoxy resin. The curing involves heating of the epoxy resin that results in a chemical reaction, and the final Office Action has not shown how the organic substrate of Master would interact with the curing epoxy resin of Bronson, and if the organic substrate would maintain its integrity in the presence of the chemistry of the curing epoxy resin.

The final Office Action has not presented prior art showing a reasonable expectation of success of such a structure. The final Office Action has not identified a reasonable expectation

¹¹ Master, column 5, lines 35-45.

¹² Master, column 5, lines 37-45.

¹³ Master, column 4, line 65 to column 5, line 10.

¹⁴ Bronson, column 8, lines 44-45.

RESPONSE UNDER 37 C.F.R. 1.116 – EXPEDITED PROCEDURE

Serial Number: 10/626,117

Filing Date: July 23, 2003

Title: ENCAPSULATION OF PIN SOLDER FOR MAINTAINING ACCURACY IN PIN POSITION

Assignee: Intel Corporation

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of success in the prior art of this combination of Master and Bronson as is required by MPEP 2143.

The applicant respectfully submits that a *prima facie* case of obviousness against claims 37 and 41 has not been established in the final Office Action, and that claims 37 and 41 are in condition for allowance.

Claim 38 was rejected under 35 USC § 103(a) as being unpatentable over Master in view of Bronson and Wang et al. (U.S. 6,610,559 B2, Wang). The applicant respectfully traverses.

The applicant respectfully submits that Wang is not prior art. Wang issued on August 26, 2003 from an application filed November 16, 2001, which is after the 27 September 2001 filing date of the parent of the present application.

The final Office Action did not address the status of Wang. The applicant respectfully requests that this rejection based on Wang be withdrawn.

The applicant respectfully submits that claim 38 is in condition for allowance.

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CONCLUSION

The applicant respectfully submits that all of the pending claims are in condition for allowance, and such action is earnestly solicited. The Examiner is invited to telephone the below-signed attorney at 612-373-6973 to discuss any questions which may remain with respect to the present application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date 12 April 2006

By _____

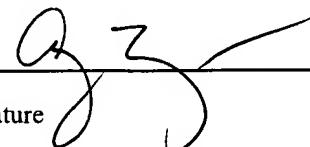
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 12th day of April, 2006.